Limiting Reagent Worksheet #1

1. **Given the following reaction: (Balance the equation first!)**

   $C_3H_8 + O_2 \text{ ---------> } CO_2 + H_2O$

   a. If you start with 14.8 g of C_3H_8 and 3.44 g of O_2 determine the limiting reagent
   b. Determine the number of moles of carbon dioxide produced
   c. Determine the number of grams of H_2O produced
   d. Determine the number of grams of excess reagent left

2. **Given the following equation:**

   $Al_2(SO_3)_3 + 6\ NaOH \text{ ---------> } 3\ Na_2SO_3 + 2\ Al(OH)_3$

   a. If 10.0 g of $Al_2(SO_3)_3$ is reacted with 10.0 g of NaOH, determine the limiting reagent
   b. Determine the number of moles of $Al(OH)_3$ produced
   c. Determine the number of number grams of Na_2SO_3 produced
   d. Determine the number of grams of excess reagent left over in the reaction

3. **Given the following equation:**

   $Al_2O_3 + Fe \text{ ---------> } Fe_3O_4 + Al$

   a. If 25.4 g of Al_2O_3 is reacted with 10.2 g of Fe, determine the limiting reagent
   b. Determine the number of moles of Al produced
   c. Determine the number of grams Fe_3O_4 produced
   d. Determine the number of grams of excess reagent left over in the reaction

Limiting Reagent Worksheet #2

1. **Consider the reaction**

   $I_2O_5(g) + 5\ CO(g)$ ----------> $5\ CO_2(g) + I_2(g)$

   a. 80.00 grams of diliodine pentoxide $I_2O_{5\ r}$ reacts with 28.00 grams of carbon monoxide, CO.

      Determine the mass of iodine I2, which could be produced?

   b. If, in the above situation, only 0.160 moles of iodine, I2 was produced.
      a. What mass of iodine was produced?
      b. What percentage yield of iodine was produced

2. **Zinc and Sulphur react to form zinc sulphide according to the equation.**

   Zn + S ----------> ZnS

   If 25.0 g of zinc and 30.0 g of Sulphur are reacted,

   a. Which chemical is the limiting reactant?
   b. How many grams of ZnS will be formed?
   c. How many grams of the excess reactant will remain after the reaction is over?

3. **Which element is in excess when 3.00 grams of Mg is ignited in 2.20 grams of pure oxygen?**

   What mass is in excess? What mass of MgO is formed?

4. **How many grams of Al_2S_3 are formed when 5.00 grams of Al is heated with 10.0 grams S?**

5. **When M_0O_3 and Zn are heated together they react**

   $3\ Zn(s) + 2\ M_0O_3(s)$ ----------> $M_{02}O_3(s) + 3\ ZnO(s)$

   What mass of ZnO is formed when 20.0 grams of M_0O_3 is reacted with 10.0 grams of Zn?

6. **Silver nitrate, $AgNO_3$, reacts with ferric chloride, FeCl3, to give silver chloride, AgCl, and ferrice nitrate, $Fe(NO_3)_3$. In a particular experiment, it was planned to mix a solution containing 25.0 g of $AgNO_3$ with another solution containing 45.0 grams of $FeCl_3$.**

   a. Write the chemical equation for the reaction.
   b. Which reactant is the limiting reactant?
   c. What is the maximum number of moles of AgCl that could be obtained from the mixture?
   d. What is the maximum number of grams of AgCl that could be obtained?
   e. How many grams of the reactant in excess will remain after the reaction is over?

7. **Solid calcium carbonate, $CaCO_3$, is able to remove sulphur dioxide from wasted gases by the reaction (balanced as written):**

   $CaCO_3$ + SO_2 + other reactants ----------> $CaSO^3$ + + other products

   In a particular experiment, 255 g of $CaCO_3$ was exposed to 135 g of SO_2 in the presence of an excess amount of the other chemicals required for the reaction.

   a. What is the theoretical yield of $CaSO_3$?
   b. If only 198 g of $CaSO_3$ was isolated from the products, what was the percentage yield of $CaSO_3$ in this experiment?